

# Community News

Space Center Houston hosts

## Robotic jousting tough as students compete in regional

By Norm Chaffee

Visitors to Space Center Houston on March 6 and 7 must have initially thought they had accidentally stumbled into a misplaced and belated Winter Olympics event, or into the NCAA Final Four basketball tourney, based on the hectic activity and extraordinary sound and energy levels coming from the large SCH central plaza.

But after they fought their way past the screaming crowds, costumed cheering squads filling the temporary bleachers, cheerleaders, judges, and waiting combatants, there was no dainty Tara Lipinski performing a daring pirouette, nor a towering young athlete dunking a basketball.

There were, however, daring, hulking, and towering mechanical robots pirouetting in a large competition arena, dunking large beach balls into a goal, to the delight of their howling supporters.

Instead of the usually sedate interactive museum-like environment of Space Center Houston, visitors on those days were privileged to watch the southwest regional robotic tournament of the FIRST Foundation. FIRST (For Inspiration and Recognition of Science and Technology) is an educational foundation that promotes the excitement of engineering, science and technology among high school students by sponsoring annual robotics competitions across the country.

This is the seventh year for the national competition, and this year, for the first time, a southwest regional competition was held in Houston to allow teams to try their designs and test their strategies prior to the national competition at Epcot Center, Orlando, Fla., in early April.

Andy Allen, recently retired from the astronaut corps and the president of FIRST, worked with representatives from JSC and SCH to bring the competition to Houston this year.

Twenty one teams from around the country competed, including six teams sponsored by NASA centers—three sponsored by JSC (from Clear Creek ISD; Houston ISD; and Pasadena ISD), two sponsored by

Kennedy Space Center, and one team sponsored by NASA Headquarters. An additional Houston area team from Oak Ridge High School in the Conroe Independent School District, sponsored by Hitachi, also competed.

The teams are typically a consortium of high school students, teachers, and engineers from sponsoring organizations who work together during a seven-week period to conceive, design, build, test, and train with their robot. The rules and requirements are received from FIRST in early January, and the robot entries must be shipped to FIRST for competition by the last week in February—truly a challenging schedule. More than 200 teams will be at the Epcot finals in Florida, including 17 teams sponsored by the various NASA centers.

Walking through the pit areas in the SCH cafeteria where the teams were making last-minute adjustments and trying to repair the wounds from earlier competition rounds, SCH President Richard Allen shook his head and said, “I can’t believe that 21 groups can receive the same requirements and rules, and the same box of parts to work with, and come up with such totally different devices.”

This year’s competition required the remotely controlled robots to pick up beach balls and place them in scoring positions along ladder-like structures radiating from a central column within a 35-foot diameter competition arena. Each of the three “ladders” had scoring positions worth one, two or three points; the placement of beach balls within the hollow central column acted to double the score for each centrally placed ball—thus three balls in the central column doubled the score three times, or by a factor of eight.

At the same time each robot is attempting to score, it can also impede the competing robots from scoring, and of course, must defend itself against attack. A match is two minutes in length and pits three robots against one another. A special rule this year allowed one human player from each team to stand at the arena perimeter and



JSC Photos by Norm Chaffee

Students from around the country participated in the recent FIRST (For Inspiration and Recognition of Science and Technology) regional tournament. Above: Students from the victorious Delphi Industrial Lighting Systems team from Detroit cheer on their team, which used an adroit and quick-acting robot to score quickly and displace the balls of the opposing teams. Left: Students from the Pasadena Independent School District Team, which fell early in the regionals, prepare to drive their robot in the competition.



attempt to throw beach balls into the hollow central column, or to use balls to knock the beach balls of other teams out of scoring positions.

Each match resulted in a hectic two-minute activity of jousting robots, aspiring Michael Jordans on the sidelines attempting to shoot beach balls in the center, and screaming supporters cheering for their teams.

Some robots gripped balls in a pincer; others scooped them up like a bottom-feeding shark. Some robots handled one ball at a time, while many could handle two or three. Most used an extensible manipulator to dunk balls into the central column and to place them on the ladders. However a couple of very clever designs had power roller designs that extruded balls through the sides of the central column and into scoring positions on the ladder

from below.

The JSC/Clear Creek Independent School District team, called the “Marauders,” did well in the seeding rounds—being seeded seventh—but was eliminated during the final rounds. The Pasadena team suffered a similar fate. The Houston team reached the quarterfinals; and the Headquarters team, the “Hot-Bots,” also was a quarterfinals competitor before being eliminated.

The team from Delphi Industrial Lighting Systems in the Detroit area took first place with an adroit and quick-acting robot, whose strategy was to score quickly and to then displace the balls of the opposing teams and to block them from scoring, an effective strategy.

Second place went to a team from Mountain Home, Arkansas, sponsored by Baxter Health Care Systems, which used the extrusion prin-

ciple to squeeze balls into the central column. Baxter’s strategy would have been a winner except for the talented blocking capability of the Delphi team in the final match.

A Honeywell team that could dunk two balls at once also was successful. The 21 teams brought almost 1,000 supporters with them, counting students, teachers, engineers, and parents. Most were specially costumed in accordance with the name of their team. Many had cheerleading squads with them, and all in all it was a festive and exciting occasion for participants and onlookers alike.

The educational activity is designed to bring the excitement of engineering, math and science to an increasing audience of students. The JSC/CCISD team’s will be at the national competition next month in Florida.

## JSC Safety Alert

### Alteration of Flammable Storage Containers

#### What happened

During a recent facility workplace inspection at JSC, flammable storage lockers were discovered altered. In most cases, a hasp and padlock were installed on the lockers after the original lock on the door failed or the keys to the door were lost.

#### Outcome

Alteration of the exterior of the cabinet has the potential to void the manufacturers warranty and compromise the fire rating of the cabinet. Many flammable storage cabinets have a double-walled door. The cabinet fire rating will be potentially compromised if any alteration of the cabinet creates a path into the cabinet by way of either a single penetration on a single-walled door or penetration through both walls on a single-walled door. The fire rating of the door is not compromised if the alteration of the cabinet did not penetrate both walls of the door in a double-walled door.

#### What You Can Do

If the cabinet has been altered, use a two-hour fire-rated caulking to fill the penetration of the screw or bolt so that the penetration through the door is sealed. Call the manufacturer for assistance if the lock on the door of the flammable storage cabinet does not work. Do not alter flammable storage cabinets in any way. The alterations have the potential to cause a fire hazard and may void the fire rating of the cabinet. If you have any further questions, please call the Occupational Safety Office at x34119 or x45931.



Students from Paul Revere Middle School District set up their display, representing various undersea mammals, for the JASON Project. The students built the large stuffed replicas as an extracurricular activity.

### JASON surfaces undersea wonders

Thousands of area students converged on NASA to participate in the JASON Project, which is sponsored by JSC’s Education and Information Services Branch.

This year’s expedition, “JASON IX: Oceans of Earth and Beyond,” studied the structure of shallow, mid-water and deep ocean environments. Students investigated a variety of marine communities and related phenomena such as coral reefs, kelp forests, hydrothermal vents, cold seeps, marine snow and exotic deep

sea creatures. Students also learned how recent discoveries in space are providing new clues to the origin of the Earth’s oceans and explored the latest evidence of oceans beyond Earth, on Jupiter’s moon, Europa.

Experts from Armand Bayou Nature Center, Texas Parks and Wildlife Department, Texas State Aquarium, Sea Center Texas, and Sea Camp at Texas A&M University at Galveston gave presentations to help teachers implement the many JASON IX curriculum investigations.